

WHAT IS CLAIMED IS:

1. A magnetic memory device comprising:

a memory cell which includes a first wiring line composed of a first wiring layer, a second wiring line composed of a second wiring layer and provided above or below the first wiring line so as to cross the first wiring line, and a magnetoresistive effect element device provided in a position where the first wiring line and the second wiring line cross each other; and

a peripheral circuit which includes a third wiring line provided around the memory cell and composed of the first wiring layer, a fourth wiring line provided above or below the third wiring line and composed of the second wiring layer, and at least one magnetic layer forming the magnetoresistive effect element device and provided between the third wiring line and the fourth wiring line.

2. The magnetic memory device according to claim 1, wherein the magnetic layer is provided so as to correspond to at least a part of the third wiring line and the fourth wiring line.

3. The magnetic memory device according to claim 1, wherein the magnetoresistive effect element device has a three-layered structure including two magnetic layers and a nonmagnetic layer provided between the two magnetic layers.

4. The magnetic memory device according to

claim 1, wherein the first and second wiring lines have each a yoke structure.

5           5. The magnetic memory device according to claim 1, wherein at least one of the first to fourth wiring lines has a yoke structure.

6. The magnetic memory device according to claim 1, wherein the memory cell further includes a switching element device electrically connected to the magnetoresistive effect element device.

10           7. A magnetic memory device manufacturing method comprising:

forming a first wiring line in a memory cell and a third wiring line in a peripheral circuit out of a first wiring layer;

15           forming a magnetoresistive effect element device with at least one magnetic layer corresponding to a part of the first wiring line and also leaving said at least one magnetic layer so as to correspond to the third wiring line; and

20           forming a second wiring layer into not only a second wiring line crossing the first wiring line in a position where the magnetoresistive effect element device is to be formed but also a fourth wiring line at least a part of which overlaps with the third wiring  
25           line via said at least one magnetic layer.

8. The magnetic memory device manufacturing method according to claim 7, wherein said at least one

magnetic layer is left so as to correspond to at least a part of the third wiring line.

5       9. The magnetic memory device manufacturing method according to claim 7, wherein the magneto-resistive effect element device has a three-layered structure including two magnetic layers and a nonmagnetic layer provided between the two magnetic layers.

10       10. The magnetic memory device manufacturing method according to claim 7, wherein the first and second wiring lines have each a yoke structure.

11. The magnetic memory device manufacturing method according to claim 7, wherein at least one of the first to fourth wiring lines has a yoke structure.

15       12. The magnetic memory device manufacturing method according to claim 7, further comprising forming a switching element device electrically connected to the magnetoresistive effect element device.

20       13. The magnetic memory device manufacturing method according to claim 7, wherein the peripheral circuit is formed around the memory cell.